Potential Agenda items for
2017 National Radiation Superfund Meeting (March or April 2017)
Monday and Friday Field Trips to DOE Laurence Livermore
and McClelland Air Force Base NPL sites
Meeting Tuesday to Thursday in Sacramento, California

Removal/Counter-Terrorism

1. **EPA R4 Goes to Fukushima.** Jon Richards represented EPA at a Fukushima's Annual Symposia: The Society for Remediation of Radioactive Contamination in Environment, where he provided input on their waste minimization, temporary storage facility and radiation risk communication. The conference focused on environmental radiation studies, along with radioactive waste management. Over 800 temporary storage facilities along with individual large containers on individual's property, must be all consolidated into the interim storage facility. Information on their latest recovery efforts around Fukushima will also be presented. *(Jon Richards, Region 4)*

Field Survey

2. **Update on Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), Rev. 2.** The four federal agencies who originally published MARSSIM came to an agreement in 2010 that MARSSIM needed a comprehensive revision due to changes in the science of radiation measurement and lessons learned over the fourteen-year time-span that had passed since its original issuance. The Workgroup began the revision process by soliciting comments from the government agencies representing the Workgroup and then from all government agencies and members of the public. In addition, the Workgroup consulted with the EPA Science Advisory Board – Radiation Advisory Committee to assess the Workgroup's proposed revision to the manual. Significant planned changes to the document currently include: 1) More specifics about measurement method uncertainty and the inclusion of Measurement Quality Objectives; 2) Additional measurement techniques (e.g., scanning only surveys); 3) Current information on survey instrumentation; 4) Additional information on using Scenario B (when the null hypothesis assumes the survey unit meets the release criteria until proven otherwise); 5) Increased emphasis on regulator interface during survey design; 6) Improved descriptions of the lower bound of the gray region; 7) Updated and more consistent terminology and language; 8) Expanded information on survey requirements for areas of elevated activity; 9) Information on survey requirements for discrete radioactive particles; 10) Use of MARSSIM for Uranium Mill Tailings Radiation Control Act requirements; and 11) An appendix on using Ranked Set Sampling for hard-to-detect radionuclide surveys. *(Kathryn Snead ORIA, Nidal Azzam Region 2)*

Waste Management

3. **EPA Superfund Radiation Intranet Webpage on Transportation and Waste**

Management: In 2010, EPA has now added a new section on Waste Management and Transportation to the intranet webpage, which may be found at: http://intranet.epa.gov/osrti/ard/spb/radiation/byproduct_material/rwdt.html. This webpage is intended to help EPA staff who are involved in the packaging, transport, and disposal of radioactive material. In 2009, EPA issued an intranet webpage that provides access to some key documents that may be relevant to Superfund radiation cleanup work. These documents may be useful for EPA staff involved in carrying out actions involving radioactively contaminated Superfund sites. The documents include proposed and final Federal Register documents (i.e., regulations), inter-agency correspondence, and training materials. This Intranet webpage may be found at: http://intranet.epa.gov/osrti/ard/spb/radiation/related.html. It is intended to supplement the Superfund Radiation Internet webpage which may be found at: http://www.epa.gov/superfund/health/contaminants/radiation/index.htm. *(Stuart Walker, OSRTI)*

4. **EPA R4 Int'l Atomic Energy Agency Committee meeting at Sellafield, UK.** Jon Richards represented EPA for the new La Trench technical workgroup for IAEA, along with 12 other int'l representatives to discuss and draft working report to help nuclear countries with past legacy near-surface radioactive waste problems. This workgroup narrowed our focus of past radioactive waste burials. Examples from Mexico, Chernobyl, India, UK, and others were given to help prepare the draft report. Information on this meeting and the future work will be presented. *(Jon Richards, Region 4)*

Ground Water

5. **Policy Guidance on Monitored Natural Attenuation (MNA) of Inorganics in Groundwater.** OSRTI will have finalized by the Superfund Radiation meeting a policy directive addressing MNA of inorganics (radionuclides and metals) in groundwater. This directive will complement the 1999 directive "Use of Monitored Natural Attenuation at Superfund RCRA Corrective Action, and Underground Storage Tank Sites." The new inorganics directive will help clarify policy issues unique to inorganics that were not addressed in the 1999 directive. The ORD three volume set of documents on MNA of inorganics will serve as technical background for the inorganics policy directive which is essentially the User Guide. This presentation will consist of an overview of the directive, including its role, scope, and major issues that are addressed. *(Stuart Walker and David Bartenfelder OSRTI)*

6. **LEAF Overview.** The Leaching Environmental Assessment Framework (LEAF) methods provide an updated tool to provide tailored estimates of constituent release (a source term) to support groundwater fate and transport modeling for potentially many uses, including CERCLA site characterization and remediation. These methods consider the effect of environmental conditions on constituent leaching by testing over a range of values for factors that significantly affect leaching from most materials. These methods were developed primarily to assess inorganics leaching from a broad range of wastes being disposed or reused. The Department of Energy (DOE) has also funded research for potential application to radioactively contaminated sites. These test methods were developed in coordination with the development of

similar methods by the European Committee for Standardization (CEN) for use by EU nations.

This overview will provide a description of the four LEAF methods, recommendations/examples of what test (or combination of tests) can be used to address site-specific circumstances and a general discussion of the applicability of TCLP, which is still required to determine whether-waste is classified as hazardous under the Resource Conservation and Recovery Act (RCRA), versus LEAF. *(Susan Thorneloe, ORD)*

7. **EPA Ground Water Investigation for the San Mateo Creek Basin, New Mexico.** EPA Region 6 is conducting a multi-phased ground water investigation to assess impacts from legacy uranium mining and milling in the San Mateo Creek Basin, a 320 square mile basin within the Grants Mining District (GMD) of northwestern New Mexico. Over 80 legacy uranium mines and four former uranium mill facilities are located within the basin. Mine water discharge operations from the dewatering of underground workings during the late 1950s to early 1980s led to an estimated 90 billion gallons of mine water being released to surface drainages within the GMD. Such operations in the upper reaches of the San Mateo Creek Basin turned arroyos and creeks into perennial flows and raised saturation levels in the shallow alluvium on a massive, basin-wide scale, with water levels raised over 50 feet in the central and lower portions of the basin. The addition of poor quality mine water changed the chemistry of the alluvial ground water by increasing the concentrations of uranium, selenium, and other metals, as well as sulfate and total dissolved solids. The hydraulic connection of the alluvial aquifer to underlying and tilted bedrock formations along the southern margin of the San Juan Structural Basin – where they subcrop into the alluvium – has resulted in widespread ground water contamination in the bedrock aquifers. Tailing seepage from the four former uranium mill sites have also contaminated the alluvium and bedrock aquifers. The San Andres-Glorietta (SAG) aquifer, which is the regional aquifer for the cities of Milan and Grants, has been impacted by the former Anaconda-Bluewater uranium mill site. EPA began this investigation in 2012 as part of a multi-agency Five-Year Plan for the GMD. The first of three planned technical reports (Phase 1 report) was completed by EPA in September 2016 for the alluvial aquifer. The second (Phase 2) report, which includes an assessment of the bedrock aquifers, is scheduled for completion in early 2017. A third report (conceptual site model) is planned for 2018. (*Mark Purcell, Region 6 Superfund Division*)

8. **The use of MIKE SHE, an integrated contaminant transport model at Lawrence Livermore Labs, CA.** Building 812 facilities were used from the early 1960s to 2009 to conduct explosives tests and diagnostics in support of national defense programs. These experiments, involved firing projectiles of depleted Uranium at an open-air firing table. Debris from the tests was scattered onto the surrounding hillsides, resulting in contamination of soil, surface water, and the underlying groundwater. The explosive testing and diagnostics were discontinued in 2009, and the site is now engaged in CERCLA environmental remediation.

In July of 2008, the DOE submitted a Draft RI/FS for Building 812 (OU9.) The Department is now proposing to update the remedial alternatives in the RI/FS, and include a site-specific human health & ecological risk assessment. As part of that assessment the DOE plans to use an integrated model named MIKE SHE. This model is based on a comprehensive numerical (finite difference) flow model, where the basic code has been expanded to integrate contaminant values in multiple media such as soil, surface water and groundwater.

In the past, sites like this often used several different models, for such analyses. (ie: VLEACH >Modflow.) This approach required dealing with the output from one model, and then re-entering it in the next model. The DOE hopes that an integrated approach will prove more efficient for this effort. The choice of models is, of course, very important. The documentation for MIKE SHE is extensive and it has been used successfully around the world.

In Jan of 2014, EPA approved the use of MIKE SHE for this effort, after expressing concerns about two major "conservative assumptions" proposed in the model.

1) The model will incorporate overland flow of ("surface" water) into the groundwater flow, including the flows in local channels and ditches. This assumption will "filter out" any contaminants that are in those colloids and suspended particles. Animals, such as the Red Legged Frog will be exposed to those particles & colloids during the wet season.

2) As proposed, the groundwater model uses several "simplifying assumptions" that limit it's ability to estimate timeframes for groundwater cleanups. Key factors, such as diffusion & back-diffusion and assumptions about the bedrock will not be incorporated.

   As of this writing, the modeling work has not been completed & documented *(Zaf Demir, LLNL/DOE)*

Post Construction

9. **Superfund Post Construction: Considerations for Remedies that Address Radiological Contamination.** The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Superfund cleanup process, outlined in the National Contingency Plan (NCP) and EPA policy and guidance, provides EPA to authority and responsibility to evaluate nature and extent of contamination at a site, analyze remedial alternatives to address contamination, and select remedies that protect human health and the environment. Some sites addressed under the Superfund program include sites contaminated with radionuclide(s). Experience with Superfund sites demonstrates that radioactive wastes at these sites are primarily by-products of four main processes or activities: research, design, or development of nuclear weapons; radioactive waste disposal; mining/processing of radioactive ores; and some forms of manufacturing. For site contaminated with radionuclides, selected remedies typically address impacted media including soils, sediments, groundwater, and surface water. The NCP states that the preference for remedy selection is to choose a remedy that reduces contaminant mobility, toxicity, or volume of the waste. However, since destruction of radioactivity associated with

radionuclides is not an option, response actions at radioactively contaminated sites generally include long time frames for achieving remedial action objectives and associated cleanup levels and in some cases, response actions will include containment activities that will include operation and maintenance activities indefinitely.

This presentation will discuss post construction completion activities that are conducted as part of the CERCLA process. The training will focus on those activities that may pertain to sites addressing radioactive contamination and will discuss those the differences between Fund-lead and responsibility lead considerations. These activities include:

- General operation and maintenance considerations;
- Monitoring needs;
- Five-year reviews; and
- Site completion requirements

This training will assist the attendees in understanding EPA's post construction policy and regulatory requirements for these activities under CERCLA. *(Kate Garufi OSRTI)*

Risk Assessment

10. **Revisions to U.S. EPA Superfund Risk and Dose Assessment Models.** The EPA Superfund remedial program's six Preliminary Remediation Goal (PRG) and Dose Compliance Concentration (DCC) internet based calculators for risk and dose assessment at Superfund sites are being revised to reflect better science. A comprehensive set of revisions to the PRG calculator was finished in November 2014. Additional revisions to the other 5 calculators were made in 2014 and 2015. A set of further revisions are expected to be finalized prior to end of 2016 and will be discussed in this abstract. There are several additional revisions that may be finished prior to HPS 2017 and will be presented if finished or discussed in more general terms if still underway. The current PRG and DCC calculators include exposures from fruits and vegetables in both the farmer and residential scenarios. This will be revised to now include 24 specific subcategories of produce. The produce intake rates are derived from 24 individual produce items, found in the 2011 Exposure Factors Handbook, that contribute to the overall produce ingestion PRG. Mass loading factors (MLFs) were also improved, from a single MLF that was applied to all produce, to 24 individual MLFs that correspond with the 24 individual produce items that make up the new produce intake rates. The user will be able to select climate zones and soil types to use a more appropriate soil to plant transfer factor from IAEA when available. In the farmer scenario for the PRG and DCC calculators, the previous 5 animal products will have an additional 4 animal products (Goat Milk, Mutton Milk, Goat Meat, and Mutton) that users may select as appropriate for their site-specific risk/dose assessment. In the resident, farmer, and indoor worker soil external exposure equations, a new variable has will be added (GSFb) to account for the gamma shielding provided by a clean soil beneath a building between the contaminated soil. *(Stuart Walker OSRTI)*

11. **Ever Evolving Adjustments to External (Gamma) Slope Factors – The MCNP era:** Prior to 2000, the U.S. EPA Superfund program assumed for purposes of estimating the external pathway for risk and dose assessment of radioactive contamination at Superfund sites, the contamination existed over an infinite distance and depth. Then EPA began to issue new guidance to more accurately reflect this gamma radiation. Most recently EPA has begun to make these adjustments using a software program Monte Carlo N-Particle (MCNP). In September 2014, EPA issued a revised PRG calculator with a new set of Area Correction Factors (ACFs) for soil in the report "Area Correction Factors for Contaminated Soil for Use in Risk and Dose Assessment Models". ACF values for all combinations of 19 source areas (ranging from 1 m^2 to 1,000,000 m2) and 5 source thicknesses of 0, 1, 5, 15, and 200 cm are estimated. In this report are presented ACF values for the 1250 radioisotopes published in ICRP 107. In September 2014, when issuing the revised PRG calculator EPA also included new gamma shielding factors (GSF) from the report "Gamma Shielding Factors for Soil Covered Contamination for Use in Risk and Dose Assessment Models". In September 2015, EPA revised the BPRG and BDCC calculators with a new report "Room Radiation Dose Coefficients for External Exposure" that provided updated F_{SURF} values which were added that account for multiple source depths (ground plane, 1cm, 5cm, 15cm and infinite depth) and multiple building materials (wood, glass, concrete, drywall and adobe mud brick were analyzed as well as 2 composite scenarios). An analysis is nearly complete to adjust external exposures for workers in trenches. These adjustment factors will be for the PRG and DCC construction worker scenarios when receptors are assumed to be in trenches for activities such as excavating soil for constructing buildings or laying down or repair utilities. Another analysis has begun of gamma shielding factors for several common building materials and thickness from contaminated soil. *(Stuart Walker, OSRTI)*

12. **Comparing Radiological Risk and Dose Assessment Models of International and National Agencies:** The U.S. Environmental Protection Agency (EPA) Superfund remedial program is conducting a comparative study between the risk and dose assessment models that are available nationally and internationally for risk assessment process at radioactively contaminated sites. The comparison includes the EPA models; Preliminary Remediation Goal (PRG) and Dose Compliance Concentration (DCC) internet based calculators for risk and dose assessment at Superfund sites, the U.S Department of Energy model; Residual Radioactive material guideline (RESRAD), the Bureau of Environmental Radiation of the State of New Jersey; Radioactive Soil Remediation Standards (RaSoRS), the U.K Government Department for Environmental, Food and Rural Affairs; The Radioactively Contaminated Land Exposure Assessment Methodology (RCLEA), The French Nuclear Safety Authority (IRSN); SYMBIOSE Model, the Germany Department of Radiation Protection and Environment; WISMUT Model, the International Atomic Energy Agency (IAEA); NORMALYSA model; The Spain Environmental Impact of the Energy Department; Screening Model for Environmental Assessment (CROM). Also the concentration tables in the NCRP (National Council on Radiation Protection and Measurements), Report No. 129, "*Recommended Screening Limits for Contaminated Surface Soil and Review of Factors Relevant to Site Specific Studies*", and the Nuclear Regulatory Commission (NRC), *"Consolidated Decommissioning Guidance"*. The main focus of this comparative study is to analyse the different default input parameters and the maximum allowable concentrations

provided by these models. This study aims to establish a common ground for cooperation between agencies by facilitating better understanding of each agency's modelling approach and identifying the similarities and differences between these agencies in the risk and dose assessment of the radioactively contaminated land. *(Nasser Shubyar ORISE Participant for EPA)*

13. **US EPA Superfund Radon Vapor Intrusion Preliminary Remediation Goal (RAD-VIPRG) Electronic Calculator.** Currently, there is no U.S. EPA guidance on correlating soil or groundwater levels of radon with indoor radon concentrations at Superfund sites. EPA is developing the Radon Vapor Intrusion Preliminary Remediation Goal (RAD-VIPRG) Calculator which is web-based calculator tool that (1) lists two radon isotopes (Rn-220 and Rn-222) known to pose a potential cancer risk through the inhalation pathway; (2) provides generally recommended risk and Applicable or Relevant and Appropriate Requirements (ARAR) based preliminary remediation goals (PRG) for groundwater, soil gas (exterior to buildings and sub-slab) and indoor air for default target risk and ARAR based levels and exposure scenarios; and (3) allows calculation of site-specific PRGs based on user-defined target risk and ARAR levels and exposure scenarios. EPA developed the RAD-VIPRG calculator to help risk assessors, remedial project managers, and others involved with risk assessment and decision making at radioactively contaminated sites. EPA is developing the Radon Vapor Intrusion Preliminary Remediation Goal (RAD-VIPRG) Calculator that (1) lists two radon isotopes (Rn-220 and Rn-222) known to pose a potential cancer risk through the inhalation pathway; (2) provides generally recommended risk and Applicable or Relevant and Appropriate Requirements (ARAR) based preliminary remediation goals (PRG) for groundwater, soil gas (exterior to buildings and sub-slab) and indoor air for default target risk and ARAR based levels and exposure scenarios; and (3) allows calculation of site-specific PRGs based on user-defined target risk and ARAR levels and exposure scenarios. The RAD-VIPRG Calculator can assist Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) remedial project managers (RPMs) and on-scene coordinators (OSCs), as well as Resource Conservation and Recovery Act (RCRA) project managers in determining whether the vapor intrusion pathway has the potential to pose an unacceptable level of risk to human health or exceed ARARs by comparing subsurface or indoor data for radon against the PRGs provided in the Calculator. The PRGs in the Calculator are not intended to be used as cleanup levels, nor are they intended to supersede existing criteria of the lead regulatory authority. *(Stuart Walker, OSRTI)*

14. **Classes on EPA Superfund Radiation Risk Assessment Calculators.** Since 2012, OSRTI and ORNL have conducted 15 all day classes on how to use the EPA PRG and DCC risk and dose assessment calculators developed for the Superfund remedial program. Participants at these classes have totaled 273 total participants, including 131 EPA staff. The training classes have been held at 5 of 10 regions, 2 national EPA meetings, and 4 outside conferences. Two more outside conference training classes are scheduled and additional regional classes are being scheduled for 2017. *(Stuart Walker, OSRTI)*

Site Specific

15. **Radiological Impacts of Uranium Mining on the Navajo Nation.** In late 2007, USEPA, along with 5 other federal agencies issued a 5-Year Plan for addressing uranium contamination caused by mining on the Navajo Nation. Primary EPA responsibilities included, in part, assessing and addressing contaminated homes and assessing abandoned mines and conducting urgent cleanup actions. In January 2013, EPA issued a report summarizing work completed during this time period as well as major findings and recommendations for continued assessment and cleanup.

In 2013, DOE was requested by Congress to undertake a review of, and prepare a report on, abandoned uranium mines in the United States that provided uranium ore for atomic energy defense activities of the United States. DOE is required to submit a Report to Congress no later than July 2014 that describes and analyzes:

- The location of AUMs on federal, state, tribal, and private lands, and the status of efforts to remediate or reclaim these mines
- The extent to which AUMs pose a significant radiation hazard or other public health and safety threat, and cause, or have caused, water or other environmental degradation
- A priority ranking for the reclamation and remediation of abandoned uranium mines
- The potential cost and feasibility of reclamation and remediation in accordance with federal law

This presentation will provide a summary of EPA actions completed during 2008-2012 with specific examples of mine investigation results and interim cleanup actions taken and provide a summary of actions to be completed in the next 5 years. In addition, the presentation will summarize the main findings of the DOE Report to Congress and how risks from abandoned uranium mines on the Navajo Nation compare with uranium mines in the US. *(Nicole Moutoux, Region 9)*

16. **Homestake Mining Company Superfund Site Cibola County, New Mexico.** The Homestake Mining Company (HMC) is a former uranium mill site located near Grants, New Mexico. The ground water at the site has been contaminated with radio nuclides leaching from a large unlined mill tailings pile. HMC has been implementing some form of remedial action to clean up ground water since the late 1970s. The remediation is complex and the strategy to remove contaminants from ground water has evolved over the last four decades. Significant progress has been made to reduce contaminants in the alluvial aquifer but concerns continue to remain in the community living close to the site. Some of the community concerns include exposure to radon from the large tailings pile, soil contamination from wind and ground water contamination reaching the drinking water aquifer.

To address community concerns the EPA recently completed a comprehensive risk assessment at the site that involved collection of over 1500 multi media samples including soil, water, radon, vegetation, and radiation survey. In this presentation the EPA will discuss the risk assessment objectives, sampling plan, challenges associated with locating background samples for various media, challenges in communicating the results of the assessment, significant comments from stakeholders and EPA's community outreach efforts. *(Sai S. Appaji and Ghassan Khoury, Region 6)*

Coordination with Other Federal Agencies

17.

Outside Presenters

18. **Stakeholder Panel.** This panel would discuss what representatives from external stakeholders would see as the desired changes to the Superfund radiation program. *(DOE, DOD, ASTSWMO, ITRC, Enviros, etc)*

19. **U.S. Department of Energy Office of Legacy Management: LM's History with the Performance of Institutional Controls.** The U.S. Department of Energy (DOE) established the Office of Legacy Management (LM) in December 2003 to manage legacy sites that have no continuing mission and to conduct the long-term surveillance and maintenance (LTS&M) activities that will ensure future protection of human health and the environment. One essential element of LTS&M is maintaining institutional controls (ICs), which are the restrictions on land use and to existing resources that have been identified and implemented during site remediation and those additional measures that LM deems prudent for protection.

LM's philosophy is that ICs require careful planning, timely evaluation, and active management. LM currently has 89 sites in its inventory and 51 of these sites require a wide range of LTS&M actions including planning, establishing, maintaining, and enforcing the ICs. For ICs to be effective, all parties affected by their implementation must have knowledge of them and must be committed to enforcing the restrictions.

Prior to establishing LM, DOE had been conducting the LTS&M Program since 1988. LM has developed significant experience with managing the ICs at its sites. This experience involves sites in 28 states and Puerto Rico, a variety of regulatory regimes, and numerous affected parties such as other federal agencies, states, local governmental entities, and private citizens. For DOE sites, DOE guidance directs cleanup programs to consider LTS&M, including ICs requirements, when selecting a remedy. For sites remediated under other regulatory frameworks (e.g., FUSRAP and Title II of UMTRCA), LM seeks to advise responsible parties

and regulators to consider the effect of remedy selection on LTS&M requirements, including ICs. Following remediation, any legacy site with residual contamination above regulatory standards will have its own unique ICs. The long-term site responsibilities typically include operation and maintenance of active remedial action systems, routine inspection and monitoring/maintenance, records-related activities, and management of stakeholder support. LM is committed to proactively managing ICs as a program to ensure their continued sufficiency for protectiveness after cleanup and that optimizes their effectiveness by adding and removing them over time.

LM has been successful in maintaining ICs that prevent exposure to contamination, including physical controls such as disposal cell covers and access controls. LM also manages a vast number of administrative controls, such as restrictive easements, environmental covenants, and deed notices.

To preserve knowledge of ICs at its sites, LM uses informational ICs and other mechanisms to ensure that current and future landowners are aware of ICs and observe the restrictions on the land or resource. These mechanisms maintain awareness and reassure the stakeholders that the sites are protective.

ICs must be in effect for as long as the contamination remains. In some cases the restrictions have been defined for a particular land use, such as industrial use versus residential use. Over time there is the potential that industrial areas can become residential so LM must continuously monitor site conditions.

LM has used ICs as an effective tool to manage legacy sites. With changes in site ownership and site conditions and the transitioning of new sites into LM, LM has gained much experience in the mechanisms and actions needed for the ICs to be established and to remain effective. In addition, LM is working more closely with states and other affected parties as they become more active partners in planning and implementing ICs. *(Cliff Carpenter, DOE Office of Legacy Management)*

Miscellaneous

20. **Green Remediation and Remedy Selection.** This discussion would focus on considering green remedial measures as part of remedy selection, include a discussion of other tools or initiatives that are underway (e.g., EPA's *Superfund Green Remediation Strategy*(August 2009)), and provide an opportunity for Regional dialogue on issues that they are facing in considering and implementing remedies that include green remedial measures. The Office of Solid Waste and Emergency Response (OSWER) Assistant Administrator Mathy Stanislaus issued the "Principles for Greener Cleanups" http://www.epa.gov/oswer/greencleanups/principles.html (Principles) on August 27, 2009. The Principles encourage all OSWER cleanup programs to consider greener approaches, consistent with existing statutes and regulations, when cleaning up sites. The Principles address cleanup

activities undertaken during any phase of site work; Regions are to document how the Principles are considered and implemented, and should assess potential green cleanups in a "transparent manner involving the community and other stakeholders…". The Principles clarify that they are not intended to allow cleanups that do not satisfy threshold requirements for protectiveness, or do not meet other site specific cleanup objectives, to be considered as "greener cleanup." The Office of Superfund Remediation and Technology Innovation (OSRTI) is currently drafting guidance as to how to consider and document green remedial measures as part of the CERCLA remedy selection process. All remedy selection under CERCLA needs to be conducted in a manner that is consistent with CERCLA and the NCP. In other words, remedial actions needs to be evaluated against the nine criteria. For example green remediation is **not a basis** for using passive remedies in lieu of more active treatment and relying solely institutional controls to achieve protectiveness. CERCLA remedial actions are expected to restore groundwater to beneficial reuse in a reasonable time frame. *(Robin Anderson and Carlos Pachon OSRTI)*

21. **Repowering America's Lands Initiative: Siting Renewable Energy on Potentially Contaminated Land and Mine Sites:** Under this initiative, EPA is encouraging renewable energy development on current and formerly contaminated land and mining sites. This initiative takes a multi-pronged approach to site cleanup and development of renewable energy production facilities on contaminated land, by conducting activities such as 1) working with the Department of Energy's National Renewable Energy Labs to develop a nationwide map to identify potential contaminated lands and mining sites with solar, wind, geothermal and biomass development potential, 2) working on pilot sites in Colorado, Montana and New Mexico to assess for Hydropower, Wind and Solar power generation potential at NPL and active mining sites, 3) promoting success stories where renewable energy projects have been sited on contaminated lands and 4) seeking input for stakeholders to determine the need for additional site reuse tools such as liability release provisions. *(Shahid Mahmud, OSRTI)*

22. **Analysis of Access to Archived Versions of CERCLA Radiation Training with States:** Superfund staff have analyzed the level of usage of the archived versions of four different internet based training courses for addressing radioactively contaminated CERCLA sites. These four training courses were collaboratively developed by EPA with the Radionuclides Team of the Interstate Technology and Regulatory Council (ITRC), a state-led coalition working together with industry and stakeholders to achieve regulatory acceptance of environmental technologies. From 2003 to 2009 EPA and ITRC offered 23 live deliveries of these classes. EPA and ITRC are able to count how many participants take each live session as well as estimate the number of times an archived course is accessed. Jean Balent and Stuart Walker of OSRTI conducted an analysis of how many times archived versions of the four training classes were accessed from January 1, 2008 until August 26, 2009. The level of usage of each of the four classes is as follows:

- "Radiation Risk Assessment: Updates and Tools": eight live sessions with 1,047 participants, archive accessed 1,710 times,
- "Radiation Site Cleanup: CERCLA Requirements and Guidance": five live sessions with 838 participants, archive accessed 3,282 times,

- "Real-Time Measurement of Radionuclides in Soil": five live sessions with 646 participants, archive accessed 2,494 times,
- "Decontamination and Decommissioning of Radiologically-Contaminated Facilities": six live sessions with 731 participants, archive accessed 2,046 times *

From this analysis, the ITRC radiation seminars have shown to be valuable training resources as they are routinely accessed well after live deliveries, often times many years later. By recording and archiving the seminars, EPA and ITRC are able to further expand the extent and efficiency of their training program. Future efforts will be directed to continue this highly successful online training program.

It should be noted that the numbers of live participants for each course are derived from self reporting from those who sign up for the course also indicating how many participants are in the room with them for the course. The numbers of persons accessing an archived version of a course only give a rough idea of how many people are taking the archived versions, since there is no indication of whether the person took the course, or accessed the same course over several times taking only portions of the course each time, or if the person accessed the course and took it with a room full of other students. Stuart Walker and Kathy Setian of Region 9 Superfund were on the ITRC Radionuclides Team and helped develop all four courses. Stuart Walker is a co-presenter of three of the courses and Robin Anderson of OSRTI is a co-presenter on one of the courses. *(Stuart Walker, OSRTI, Robin Anderson, OSRTI)*

23. **Update on OSRTI projects.** Overview of OSRTI developed projects or developed by other offices for OSRTI, that are expected to be finalized within a year. *(Stuart Walker, OSRTI)*